GENERAL LIBRARY
JUL 19 1920
UNIV. OF MICH.

THE JOURNAL OF PHILOSOPHY PSYCHOLOGY AND SCIENTIFIC METHODS

VOL. XVII. NO. 15: JULY 15, 1920

CONTENTS

Normal Logic or the Science of Order: L. E. HICKS 393

A New Content Course in Philosophy: GREGORY D. WALCOTT .. 408

Reviews and Abstracts of Literature:

Aristotelian Society's Problems of Science and Philosophy: JAMES GUTMANN 415

Bridges's Abnormal Psychology: C. S. YOAKUM 418

Journals and New Books 419

Notes and News 420

PUBLISHED FORTNIGHTLY

THE JOURNAL OF PHILOSOPHY
PSYCHOLOGY AND SCIENTIFIC METHODS

All communications to the Editors should be addressed to PROFESSOR FREDERICK J. E. WOODBRIDGE, or Professor WENDELL T. BUSH, Columbia University, New York City.

Subscriptions and advertisements should be sent to THE JOURNAL OF PHILOSOPHY, Sub-Station 84, New York City. The annual subscription price (twenty-six numbers) is $4.00 and the charge for single numbers is 20 cents. Advertising rates will be forwarded on application.

The Journal of Philosophy, Psychology, and Scientific Methods is owned and published by Frederick J. E. Woodbridge and Wendell T. Bush, at Lancaster, Pa.

Entered as second class matter, January 19, 1904, at the Post Office at Lancaster, Pa., under Act of Congress of March 3, 1879.

Obras del Dr. José Ingenieros

NEUVAS EDICIONES CORREGIDAS POR EL AUTOR

La simulación en la lucha por la vida -	(11.ª edición)	$1.—
Simulación de la locura - - -	(8ª edición)	2.—
Sociologia Argentina - - -	(7.ª edición)	2.—
Criminologia - - - - -	(7.ª edición)	2.—
Principios de Psicologia - - -	(6.ª edicón)	2.—
El hombre mediocre - - -	(5.ª edición)	1.—
Hacía una moral sin dogmas - -	(2.ª edición)	1.—
Proposiciones - - - - - - - -		1.—
La evolución de las Ideas Argentinas Vol I (La Revolución)		4.—
Amhegino - - - - - - - - -		1.—
Histeria y Sugestion - - - - - -		2.—

EN PRENSA:

Al margen de la ciencia (5.ª edición)

La evolución de las Ideas Argentinas Vol. 2 (La Restauración)

Editadas por la: CASA VACCARO-Avenida de Mayo 638-Buenos Aires

NOTA.—Se reciben suscripciones a la "REVISTA DE FILOSOFIA" que dirige el Dr. Ingenieros, Importe de la suscripcion anual, Interior $ 10m/n., Exterior $5 oro/s

Vol. XVII, No. 15. July 15, 1920

THE JOURNAL OF PHILOSOPHY
PSYCHOLOGY AND SCIENTIFIC METHODS

NORMAL LOGIC OR THE SCIENCE OF ORDER

I. What is Logic?

UNDER certain conditions all men think alike; judgments and inferences are universal. "Where there is smoke there is fire," is an inference arrived at in precisely the same way, and with precisely the same result, no matter whether the thinker is a cowboy or a philosopher. Yonder on the wooded hillsides rises the gray vapor, and we know at once that a fire has been kindled.

What is the ground of this unanimous conclusion? Is it instinct? Many logicians would answer in the affirmative. They might, perchance, even stigmatize it as *blind instinct.* "Common-sense deduction probably moves by blind instinct." (A. N. Whitehead: *The Organization of Thought,* p. 127.) "The natural behavior of men, as of other animals, is not logical, but instinctive." (R. C. Lodge: *Modern Logic,* p. 1.)

Are common-sense conclusions a matter of heredity? Again we get affirmative answers. "The main outlines of life are fixed in the main by inherited racial tendencies." (R. C. Lodge: *Modern Logic,* p. 1.)

Other logicians would say that common-sense conclusions are intellectual rather than instinctive. They might even hint that the superior pose, intellect *versus* instinct, affected by some authors towards ordinary mortals, is merely a bit of priggishness. But suppose that we, for the sake of argument, grant the instinctive solution. It may enlarge our conception of instinct and heredity to an extent such that we, after all, may approximate the intellectual solution.

We shrewdly suspect that there is something deeper than instinct, deeper than heredity, at work to produce this remarkable harmony of thought in minds so diverse in native endowments and acquired culture. We want to go a bit below the surface and see if there is not some profound reason for common-sense behavior. It may be in some sense both instinctive and hereditary, but is that the

end of the matter? Is it to be summarily excluded from further consideration by the logician?

The basis of instinct is cosmic order. Cosmic organization consists in an intricate network of constant relations, such, for instance, as the familiar dyad relation, smoke—fire. Instinct—or intellect, whichever it may be that is at work in common-sense mental activity—acts in harmony with these constant relations. Such action implies a definite type of nervous structure, and this is propagated from generation to generation. Thus inference may be, in a liberal sense of the terms, both instinctive and hereditary; but all the same it is its solid basis in cosmic order that makes it uniform in all minds.

But is common-sense inference logical? The authors cited above evidently mean that instinctive hereditary thinking is not logical. "Not logical, but instinctive," is their verdict. They urge us to become logical by deliberate choice and determined perseverance. "The value of cultivating such a mental attitude is beyond question." (R. C. Lodge: *Modern Logic*, p. 3.) Just as if any sane mortal could help being logical. The cosmos is logical, and its objective control settles the matter for us out of hand. This, of course, is not to deny the unquestionable value of *improving* the inborn logical faculty, bringing more clearly into consciousness its nature and its guiding principles.

We need to enlarge our conception of what is logical. When we characterize a given treatise or discourse as logical, what do we mean? Certainly not that it is cast in syllogistic form. We mean that it is clear, cogent, coherent, well arranged, orderly. Logic is the science of order. And order is cosmic in its range and influence. Sane thinking is logical thinking not simply because we want it to be logical. It is not ultimately governed by human desire or caprice. It is logical because the universe is logical, and we think—so long as our thinking is normal—in harmony with the environment. And by the environment we mean not merely the material universe but the whole universe, including both mind and matter. Whether or not the cosmos included a mental element from the beginning, it certainly does now include mind. And its constituent parts are not at war; they blend and harmonize. Not only are we in the cosmos; the cosmos is in us. The mental world, so long as it is normal, is no less orderly than the external world. The stars in their courses tell the story of cosmic order; they "sing together" as in the creation. And the mental world responds in sympathy; "deep answers unto deep." The notes of harmony in the material universe are matched with answering strains within—unless, as sometimes happens, the latter are "like sweet bells jangled, out of tune." Our normal thinking flows in orderly channels to reach sure and sane conclusions because

both mind and matter are shot through with the same systematic texture. Cosmic order is internal as well as external. Logical thinking is clear, sure, goes straight to the point, because it is the thought of a sane thinker in a sane world, not a world of chance. This, of course, is not to say that all human thinking is sound and valid. But when it does fall short of the logical ideal, that is because we misconstrue or misapply some item of cosmic organization.

Defining logic as the science of order is more comprehensive than the old definitions. It links logic with the orderly cosmos, bases it upon the *norms*[1] of cosmic order, thus giving it an objective as well as a subjective reference. For these norms are both objective and subjective; they are bedded in the structure of the material universe and also in the constitution of the human mind. This gives normal logic a just balance as between objective and subjective control. The old logic is too exclusively subjective, too anthropocentric. The familiar definition, "Logic is the science of reasoning," referred exclusively to human reasoning. "Logic is the science of the laws of thought," referred to the ways in which *men* think, ignoring the objective control of cosmic order. A clear example of the old anthropocentric point of view is the following remark of Baldwin in his Dictionary of Philosophy, Vol. II., p. 21.

"It is true that the contemplation of a state of things believed to be real may cause the contemplator to believe something additional without making any classification of such sequences.[2] But in that case he does not criticize the procedure, nor so much as distinctly reflect that it is just. He can, consequently, not exercise any control over it. Now that which is uncontrollable is not subject to any normative laws at all; that is, it is neither good nor bad; it neither subserves an end nor fails to do so. But it is only the deliberate adoption of a belief in consequence of the admitted truth of some other proposition which is properly speaking reasoning."

According to this dictum logical thinking must be under subjective control. Just what that means might not be easy to determine, but at any rate it ignores—nay, it flatly denies—objective control. "That which is uncontrollable [by the thinker] is not subject to any normative laws at all." But external control is a stubborn fact; we

[1] In view of the leading rôle of the norms of cosmic order *Normal Logic* is an appropriate name for the science of order.

[2] "Classification of sequences" here refers to Baldwin's definition of logic, or its "central problem," as the "classification of arguments," a very narrow and inadequate definition. The primary and essential business of logical thinking is the *making* of judgments and inferences. Classifying them as good or bad is secondary, not as he claims the "central problem" of logic. Indeed it is not a problem at all for the original ordinary thinker; and even for the critical logician it is just one problem among many.

must think in harmony with the environment or go crazy. The insane man ignores objective control, and consequently revels in hallucinations.

The practical consequences of this dictum, if it were rigidly applied, would be far-reaching—more radical and sweeping than its author probably realized. If we sternly exclude from logic all judgments and inferences based on objective control, it would be interesting to consider just what we have left. The fundamental division of logical functions is twofold. There are, in the first place, Direct Interpretations of the Environment, first-hand judgments and inferences evoked when the thinker is confronted with a natural situation not expressed in words; for instance, vigorous puffs of steam from the spout of the kettle imply that the water is boiling. We know the "something additional" to what we see without applying a thermometer, and we are constrained to believe it on account of the constant relation between boiling and steam. It is a clear case of external control. The thinker has no power to reject the conclusion.

There are, in the second place, Verbal Implications, those logical functions characterized by "deliberate adoption of a belief in consequence of the admitted truth of some other *proposition.*" Baldwin follows traditional logic in accepting only verbal implications as logical. Direct inferences from reality, which are clearly under objective control, being thus excluded, we must inquire into the kind of control to which verbal implications are subject, if we would meet Baldwin on his own ground. The justice of excluding the first grand division of logical functions, spontaneous dyad inferences,[3] will be considered below.

For an example of verbal implication let us suppose that we have accepted as true the verbal proposition, "Arnold is a traitor." We are thereupon forced to the conclusion, "He deserves death." Here the control is of a somewhat mixed character. There is, on the one hand, human custom, possibly embodied in statute law. On the other hand there is self-preservation of the community, that "first law of nature," which demands the death of a sly enemy within the gates. Human custom has a natural sanction. But no matter whether we emphasize the human or the natural factor in this kind of control, it is in either case objective control for the individual thinker. Even the human factor in it is cosmic, for cosmic order includes humanity and includes constant relations which may be either wholly or partly of human origin, such, for instance, as the relation treason—death.

[3] *Dyad inferences* are inferences based on dyad relations, such as the simple relation A — B, or steam—boiling water. Dyad relations far outnumber the more complex relations.

Whatever of order has been evolved within the cosmos is a part of cosmic order.

The above example illustrates one kind of objective control in verbal implication—objective at least so far as the individual thinker is concerned. Another kind of objective control is necessity. All logicians recognize certain conclusions as necessary. But necessity means imperative objective control. The thinker has no option left when necessity is in the saddle.

External physical control is still another kind of objective control, and it applies both to verbal implications and spontaneous dyad inferences. In many cases the control is precisely the same no matter whether the datum is a verbal proposition or a fact directly observed. For instance, "Barometer falling—storm coming," is just the same inference, and it is under the same external control, no matter whether I get the datum by looking at the instrument or by reading the weather report. We mean that it is essentially the same, and deserves the same honorable treatment as a sound and valid piece of logical thinking, though in our fundamental classification of logical functions it is in the one case a direct interpretation of reality, and in the other case a verbal implication.

We find that verbal implications may be under objective control either of human origin or of external physical origin. Direct interpretations of reality are generally under physical control. Such being the actual status of both verbal implications and spontaneous dyad inferences, *i. e.*, they are generally under some sort of control which is objective to the individual thinker, we fear that we should have left a very beggarly scrap of logic if Baldwin's anthropocentric dictum were rigidly applied.

In order that we may not do injustice to Baldwin, an author whose ability is freely recognized at home and abroad, we quote the following from the Glossary of Terms in his *Genetic Theory of Reality*, p. 315.

"*Control:* the limiting, directing, regulative (as over against the constitutive) factor in the determination of anything.

"Illustrations: the determination of a physical object has the external control afforded by sensations of resistance; that of ends, goods, objects of desire, has the inner control of appetite, interest, *etc.*"

This definition, together with the fact that all through his *Genetic Logic* he recognizes external control, relieves Baldwin of the reproach of ignoring so obvious an element of logical thinking. Still this leaves him in the inconsistent position of acknowledging that factor without giving it due weight in his dictionary definition of logic.

Incidentally it adds the weight of his authority to our contention for the existence and efficiency of external control.

As for the justice of excluding from logic spontaneous dyad inferences, two-term inferences, the reason for it assigned by Baldwin is clearly untenable. To exclude them for lack of subjective control, and to apply that test impartially, would exclude almost the whole of logic. The old logicians seem to have excluded them on the ground that they are not syllogistic. In the last analysis their reasoning was a *circulus in probando.* Direct dyad inferences are not logical because they are non-syllogistic. The syllogism is the universal type of reasoning because whatever is non-syllogistic is not truly logical. Reasoning in a circle is not very conclusive.[4] We shall have to search for better grounds than either Baldwin or traditional logic has to offer if direct interpretations of reality are to be permanently excluded from logic. Since these better grounds are not clearly in sight we make bold to regard spontaneous dyad inferences as logical. We are the more inclined to accept them when we consider the absurd consequences involved in their rejection. Inferring dirty weather from falling barometer would not be logical if I made the observation myself. I must have before me, and that accepted as true, the verbal *proposition,* "The barometer is falling," in order to proceed in the proper manner. Absurdities like this are among the grave consequences of setting up an arbitrary artificial standard of what is logical. I see the flash and hear the report of a gun, and see a man fall dead. I might think it was a case of murder. At the very least my inference would be homicide, whether or not it might be justifiable. My neighbor, a juryman, hears the same facts embodied in oral testimony, *verbal propositions,* and he thereupon draws the

[4] Some logicians who may admit that spontaneous two-term inferences are logical would no doubt claim that they are enthymemes, syllogisms in embryo, and proceed to *make up* a major premise for each of them. We wish them joy of that unique industry. The outcome of their labor of love might be something like this:

Every case of that peculiar grunt being heard is a case of a bear being somewhere about.

This is a case of that peculiar grunt being heard.

This is a case of a bear being somewhere about.

We are not quite sure that such labored results of that industry are wholly free from the easily besetting syllogistic sins, but aside from that, do they represent actual thinking? Even if it could be shown that civilized adults think in syllogisms, it is a far cry from the modern man in a frock coat to the naked troglodyte. In dim forests, himself hungry and beset with hungry beasts, quick and sure thinking was more to the point than triple-line syllogisms. That bear might pick his bones before he could make up a major premise. It is a common fallacy to project back into the initial stages of evolution features which belong only to its latest stage. We fear the cave man would turn in his grave if he were told that he must think like an Aristotle.

same conclusion. Is his reasoning any more logical than mine? Both are based on the same principle of cosmic order, the fatal effect of gunshot wounds. Both I and my neighbor are forced to believe as we do. It would defeat the ends of justice if jurymen assumed to control their own thinking in defiance of external physical control.

As a matter of fact first hand inferences are not only logical but better, sounder, more reliable than verbal implications, those pets of the old logic. The eye-witness has the whole situation before him and is able to shape his conclusions accordingly. If the victim had a loaded gun pointed at his assailant, we may infer justifiable homicide in self-defense. It is extremely difficult to bring out all the modifying conditions in oral testimony. Few witnesses have the faculty of accurate observation and lucid description. Memory is notoriously treacherous. All these handicaps to verbal implications weigh heavily against them. Our direct judgments and inferences arising spontaneously when confronted with a natural situation not expressed in words, are not only the most numerous but also have the greatest practical value for the guidance of conduct. Excluding them from logic is a gross waste of good logical material.

Now while we are insisting on the grave consequences of excluding dyad inferences from logic we must not ignore the fact that equally significant consequences follow from their acceptance as logical. But the advantage on the side of accepting them is this: In that case the consequences are beneficial. Notably the scope of logic is much extended. The current ordinary reasoning of mankind is chiefly of the spontaneous dyad type. So was that of primitive man; so is that of children, though both are normally logical in the just and rational sense of that term.[5] All this broad field of investigation, from the thinking of the cave-man to that of the philosopher, is fair game for the logician, and its diligent cultivation would make logic a live and growing science, a crowning benefit most desirable of all.

Notwithstanding the lack of sound reasons for their attitude, logicians who desire to conserve the old landmarks will doubtless continue to resist the admission of those wild cattle, spontaneous dyad

[5] Some authors, as we have seen above, may pronounce common-sense reasoning merely instinctive, not logical. That is a fad akin to the lordly air of the genus *Homo* towards other animals—his own ancestors, by the way. All signs of brute intelligence he simply labels *instinct* and lets it go at that.

Professor A. N. Whitehead, after stigmatizing common-sense thinking as moving by "blind instinct," so far forgets himself as to admit that the inference "mewing heard ∴ cat somewhere about," is a case of "deliberate ratiocination" (*The Organization of Thought*, p. 142). But this is a typical dyad inference, and "the man in the street" would handle it in precisely the same way as our eminent symbolist.

inferences, to the sacred precincts of their neat logical pinfold. They scent danger from afar; with good reason too, for normal logic is frankly revolutionary in its acceptance of dyad inferences as logical.

We do not claim originality for our definition of logic. Credit for it is due to Professor Royce. He used it in his excellent article in the *Encyclopedia of the Philosophical Sciences*. But Royce failed to grasp the full breadth and significance of its cosmic affinities, and he developed only the mathematical side of it. His exposition bristles with symbols and formulas.

We aim to develop the other side of normal logic, the every-day practical side. For this purpose we find algebraic symbols unnecessary, in fact not only unnecessary but confusing and hampering. Ordinary language is quite adequate for the expression of simple judgments and inferences. Many algebras of logic have been invented, very diverse and even hostile and contradictory; but they all agree in that they are ponderous, formidable, unwieldy. To use such heavy machinery for the expression of the simple judgments and inferences of ordinary logical thinking would be like setting up a powerful triphammer to drive a nail.

For a short answer to our initial query, What is logic? we may say that as a mode of mental activity it is simply sane, coherent, orderly thinking. Normal logic broadens the traditional conception of this science by emphasizing these three factors: (*a*) the existence and efficiency of external control, (*b*) a well-balanced twofold basis of reference both objective and subjective, (*c*) the sound logical quality and value of spontaneous dyad inferences.

II. Logical Criteria

How shall we know what is logical when we see it? The detailed analytical investigation, aimed at disclosing the essentials of logic in every one of its evolutionary stages, demands *criteria* to enable us to distinguish what is truly logical from that which lacks the essential logical marks. But in the mental sciences, just as in commerce, demand often outruns supply. Good logical criteria are rare. The old definitions will not serve our purpose. When we say that logic is the science of reasoning, our predicate is sadly in need of definition; and any good criterion of reasoning would also be a good criterion of logic. The definition is true enough, so true indeed that it is a truism. But like other tautologies it is worthless as a practical test of what is logical.

Many writers accept syllogistic form as a practical test of what is logical. But judgments are logical, though non-syllogistic. Also direct interpretations of reality are logical, though non-syllogistic.

This syllogistic criterion implies adherence to the traditional view that verbal implications alone belong to logic. The syllogism has a legitimate function as an *ex post facto* analysis of some of these verbal implications, but by no means as the sole and universal type of reasoning. Hence syllogistic structure is far too narrow in its scope to serve as a logical criterion.

Professor Baldwin specifies certain logical criteria which are well worthy of our consideration. On page 271, Vol. I., of his admirable work on *Genetic Logic* he says:

"It is, therefore, now not a difficult thing to express an opinion which we should expect to find fairly acceptable as to the logical criterion. If we are asking about the criterion of the function, it is simply that quite definite and unambiguous attitude of the mind, always indicative of judgment as act or disposition, ordinarily called Belief. If we, on the other hand, wish to know the criterion of the content of the logical, it is that relatedness which fulfils and motives theoretical interest. If, yet again, we are bent on inquiring what is the criterion of this mode of psychic life as a whole, that character which determines its place in the sequence of modes of cognition, we have to say that it is the dualism of subject and object, meaning by subject the 'I' that thinks and judges, and by object the 'me' or other thing that the 'I' thinks and judges about."

Belief, Relation, and Dualism of Subject and Object, are Baldwin's three logical criteria. The first is good as far as it goes; sane logical thinking commands belief. We believe our logical conclusions because we think they are true. True-or-false quality is a mark of what is logical. But while this acceptance with belief is a real logical mark it is not an exclusive mark. Many things which are alogical inspire belief.

Relation is more fundamental than belief. It is in fact the very bed rock of cosmocentric logic, so that it has been proposed to define logic as the science of relations.[6] Relation stands preeminent among the norms of cosmic order. Its great value is due to the fact that many relations are *constant* in human experience. Constancy of relations is the backbone of normal logic. The old logic based its universals upon the so-called *necessary connections*. These are at bottom the same as constant relations, but we prefer the latter name for them because all we really know is a certain fairly reliable degree of constancy. Necessary connection is an arbitrary assumption; reasonable constancy of relations is a matter of uniform human experience. For instance, we confidently assume that feline nature with all its faculties and attributes, accompanies the feline voice, and may

[6] *Cf.* Albert E. Avey, "The Present-day Conception of Logic," *Phil. Rev.*, XXVII., 4, p. 405.

be inferred from it when we hear mewing in the dark. And this we do because in our experience the cat is always there when we hear that note, not that there is any necessary connection between mewing and cats.

An illuminating side-light on the value of constant relations is obtained by comparing logical inferences based upon them with psychological suggestion, or association of ideas. Suggestion is free and easy, unfettered by any rigid control; it may fly wide and wild; any given thing may suggest any other. Inference based on a constant relation keeps to its plain beaten path. In suggestion there is no mental determination, no assertion, consequently no true-or-false quality. Inference implies a stand taken, a mental posture of assertion or denial, consequently something that may or may not be true. Suggestion adds nothing to our knowledge; it merely flings in one more item in the mad, seething, irresponsible flood of consciousness. Inference is cognitive; it makes a fresh and real contribution to our stock of knowledge.

But with all its excellence relation is too general for a logical criterion. It includes logical thinking and much more. Indeed it is questionable whether any sort of mental activity whatever can be mentioned which does not involve relations.

As for Baldwin's third criterion, subject-object dualism, that also is too broad in one sense, but in another sense too narrow. Once this dualism has arisen in consciousness it is present in substantially all mental activities; it is not limited to logical thinking. In that respect it is too general for a logical criterion. But from another point of view it is too narrow. It is a blanket which spreads away beyond the sleeper on one side and fails to cover him on the other side. In the history of mental development logical thinking begins earlier than clear recognition of "I" and "That." A child thinks truly and clearly about many things before he clearly distinguishes himself as a thinking subject. Just when subject-object dualism distinctly arises in consciousness is one of the most delicate and difficult problems in psychology. That fact alone condemns it as a logical criterion. A criterion ought to be plainer, more obvious, than that of which it is a mark. But here the contrary is true; we can discover logical thinking easier than we can determine the presence in consciousness of the dualism of subject and object.

It is interesting to note that Mansel regards subject-object dualism as a mark, not of logical, but of *psychological* judgment.

"Every operation of thought is a judgment in the psychological sense of the term, but the psychological judgment must not be confounded with the logical. The former is the judgment of a relation

between the conscious subject and the immediate object of consciousness; the latter is the relation which two objects of thought bear to each other." (*Prolegomena Logica*, pp. 54–55.)

Mansel is more hopelessly wrong than Baldwin. In common with the old logicians generally, he has in mind only modern adults, people like himself, in whom subject-object dualism has been long established. With such thinkers in mind he can well believe that each thought is accompanied by subject-object dualism, but for that very reason it is a bit of perverted ingenuity to set up that dualism as a distinction between logical and psychological judgment. His distinction is futile and needless for another reason. Judgment is one, not two. The psychologist may indeed ignore its logical function, viewing it exclusively from his special angle as part of the whole stream of psychic life which it is his business to describe; but that change of viewpoint does not change the thing viewed. Judgment is the same thing all the time, though one man may treat it psychologically and another handle it with a clear logical aim and method.

Mansel's logic, like all traditional logic, is a cross-section of logic in its latest stage only—a distorted cross-section at that. It is bound to be distorted because it misses the historical threads of logical evolution. Fully to comprehend the present we must always dig down into its antecedents. Baldwin's more rational method is that of a longitudinal section of logic, or at least a series of cross-sections at critical points of its evolutionary career. Fundamental conceptions of logic are radically modified in the light of this method. It goes far to modernize logic. Baldwin's *Genetic Logic* is a rich treasure-house of suggestions in the very line of progress which we consider most hopeful and fruitful for logical science.

Two additional marks of what is logical may be named, though, like those already mentioned, neither of them can be accepted as the single ultimate criterion. A very distinctive characteristic of normal logic is its cognitive efficiency. Judgments and inferences are the chief means of advancing in knowledge. We *know* that the day is windy when we see through the window waving branches of trees, though in the closed room we do not feel the wind. We *know* that the cat is somewhere about when we hear mewing in the dark. A constant relation would fail, cosmic order would be outraged, if that feline voice turned out to be produced by a puppy. This cognitive mark assumes special significance by contrast with the cognitive imbecility of syllogistic logic. Syllogisms add nothing to our knowledge; neither do the old immediate inferences. It is, however, true that judgments and inferences are not the only means of advancing knowledge. Hence cognitive efficiency is not the ultimate logical

criterion. It is a real mark of what is logical in the sense of that term for which we are contending, but it is not an exclusive mark.

Whenever thought becomes inferential it is logical. Smoke rises vertically and we expect fair weather. Our thought is inferential and therefore logical. But the trouble about this is that logicians do not agree as to what is an inference. For us inferential quality of thought is the best possible mark of what is logical, because we accept spontaneous dyad inferences as sound logical elements. But other logicians would enter a protest. Furthermore this mark fails of completeness. What it includes is verily logical, but it does not include all that is logical. Simple judgments are logical though not inferential.

On the whole it seems difficult, if not impossible, to hit upon any single infallible logical criterion. Now when the very best is unattainable, we must perforce be content with the next best. In the present case the next best would seem to be a *combination* of the best available single marks of what is logical. Logical thinking is based on constant relations, inspires belief, has true-or-false quality, advances knowledge, is orderly, coherent, harmonious with the environment. The concurrence of these marks constitutes a fairly reliable logical criterion, a criterion so obvious in its general trend that mankind at large has reached a pretty definite conclusion as to what is logical.

III. Logic and its Neighbors

Psychology is next neighbor to logic on one side, and epistemology on the other side. Since we have not found any absolute logical criterion, it goes without saying that we shall not be able to draw any hard-and-fast line between logic and its neighbors. Epistemology is the theory of knowledge, but logic also is cognitive. Both, therefore, involve the theory of knowledge, but with this difference: logic, like the other sciences, takes the possibility of knowledge as a postulate, while epistemology raises the fundamental question, How can we know anything at all? Logic takes it for granted that we can and do know things, and goes on from that postulate to trace the progress of knowledge and the organization of common knowledge into a system worthy of the name of science. In that sense it is a theory of knowledge and involves an epistemological element.

It also involves psychological elements in the sense that it handles much of the same matter as psychology. Both deal with mental activities, but with a different aim, and a different method. Psychology is broadly descriptive, logic primarily functional, just as anatomy describes the bodily members while physiology is concerned with their functions. Judgment and inference are the special functions

characteristic of logic. They serve in a general way to characterize it, but though distinctive they are not absolute and exclusive distinctions. Both judgment and inference touch upon the theory of knowledge, and both of them may be treated psychologically. Thus at every turn we are baffled in the attempt to delimit logic with severe strictness. In fact ordinary thinking—still more primitive thought—is all very much of a piece, undifferentiated by those sharp distinctions erected by modern analysis.

A short cut, an easy method, albeit an arbitrary and unfair method, of delimiting logic, is to label everything psychological that has about it any shadow of doubt. In the minds of symbolists and logicians of the old school, that will be the fate of our direct interpretations of the environment. A bare glance at the actual genesis and subsequent course of logical evolution ought to be an effective rebuke to that shorthand method. The cosmos itself is logical, and minds, both brute and human, evolved under the steady pressure of cosmic order, naturally contain the essential elements of logic *ab initio*.

The fact that we are not able to delimit logic with sharply defined boundary lines need not distress us, for that is the actual status of all sciences, and of subordinate groups within each science. It was only the pre-Darwinian naturalists who had the privilege of dealing with immutable species bounded by absolute distinctions. Darwin opened the floodgates and set everything adrift. Your modern biologist is content with *types*. The high light on the type shades off into a penumbral zone overlapping the penumbra of the next neighbor. So it is with logic. The logical type is inference, but it shades off into judgments and concepts, and these may, of course, be treated psychologically.

There is one consideration which goes far to justify the old claim of logic to be *Scientia Scientiarum*. Every science must be developed logically. This brings logic into intimate relations with all of the sciences. But the old claim of logical primacy receives nothing but contempt so long as logic is taken to be traditional syllogistic. To claim that every science must be developed in formal syllogisms would verily deserve contempt. But in sober truth logic is the science of sciences when its real character is recognized as being marked by thinking that is sane, orderly, coherent, and in harmony with the environment. Every science must be developed by that sort of logical thinking.

Another old notion the justice of which depends on whether logic is modernized, is its function as a propædeutic to philosophy. Traditional logic has small claim to that honor, but a rejuvenated logic

may regain the old pedagogic relation to philosophy and metaphysics. That a sound logical training would be an advantage to philosophers is evident from the fact that some current philosophies would clearly be improved by being more logical. On the other hand, none of them would be improved by being more syllogistic.

Philosophy and metaphysics need the friendly aid of logic more directly than other sciences. According to Professor Hobhouse the very heart of the rational cosmos, "the ultimate justification of thought and experience," is to be found "in its character as a coherent system, a whole in which the diverse parts support and necessitate one another." (*Mind in Evolution*, p. 371.) Now the nexus of a "coherent system" is logical. Philosophy and metaphysics which treat of the whole rational cosmos, are, therefore, grounded on logic in a sense more profound than that which requires for them, as for other sciences, logical precision in their development.

IV. Static Order and Dynamic Order

The conception of logic as cosmocentric may be repugnant to some persons on the ground that it seems to them to be a surrender to naturalistic or mechanistic philosophy. Are we not in danger of losing some precious inheritance of humanity by boldly accepting cosmic order as the basis of logic, instead of adhering to the laws of human thinking with all their delicate and exalted refinements? Is it quite safe to abandon the comfortable old anthropocentric homestead and trust ourselves wholly to cosmic influences?

For the comfort of such persons we may say, in the first place, that the cosmic order on which normal logic builds includes all the refinements of human thinking. Every actual, solid and permanent achievement of mankind, whether in science, philosophy, art, literature, poetry or religion, is part and parcel of cosmic organization. By its cordial recognition of these human elements normal logic becomes strictly neutral as between naturalism and idealism. It is truly a natural system in that it banks on actual conditions, but it gives due weight to each and every one of nature's constituent elements, mental and spiritual as well as material. As a slight hint that it is not likely to foster partiality to naturalistic philosophy, or hostility to idealism, though it is a natural system, it is interesting to note that Baldwin's *Genetic Logic*, a system more akin to normal logic than any other now before the public, ends up with *Pancalism*, the doctrine of the *All Beautiful*. Also it is noteworthy that idealism and naturalism are approximating so nearly that some philosophers would themselves be puzzled to say on which side of the line they belong.

In the second place we may point out the salient fact that the actual organization of the cosmos, apart from its human element, is both mechanical and teleological. There is on the one hand Static Order, orderly arrangement in itself and for its own sake, and on the other hand Dynamic Order, orderly arrangement with reference to specific results. The joint effect of these coexisting and interacting phases of cosmic order is an admirable combination of stability with flexibility. So long as normal logic truly reflects cosmic organization, it is not in any danger of being swamped in mechanism. If it ever hardens into a rigid formalism it will not be by following nature but by ignoring those adaptations which give infinite variety and plasticity to nature's products.

A familiar illustration of fundamental order-types and their modifications to fit them for special conditions, is found in the lateral appendages of vertebrates. The essential elements in the type of a vertebrate limb are these: first one bone, then two bones side by side, then a bunch of small bones, then five bones side by side, and finally five digits. This combination prevails so widely, and is so often realized in animals extremely unlike in other respects, that naturalists have no hesitation in accepting it as a type and describing its elements with all the minuteness and positiveness which belong to the description of real things. It *is* a real thing, a real norm of cosmic order, a norm which defined the fundamental lines in the pattern of your arm, the eagle's wing, the lion's paw, tracing them out all from the same archetypal model.

But how does nature handle this type? Instead of holding to it as a rigid inflexible pattern, she plays all sorts of tricks with it, spreads it out as a paddle for swimming or a wing for flying; swings a digit about as a thumb for grasping; lops off a digit here or a pair of them there, finally, in the foot of the horse, dropping all but one in the rage for concentration and solidarity. In short nature takes no end of liberties with the general type, treating it as a sort of convenient platform on which to stage her everchanging play of special ends, trimming it down or stretching it out just as the act in hand may require. Thus does nature achieve both stability and flexibility by the constant interplay of static and dynamic order.

We often see the terms *order* and *adaptation* paired off and used as if they were equivalent to static order and dynamic order.[7] This is inappropriate; it implies a contrast which does not exist, *viz.*, that

[7] A suggestion for our use of the terms static order and dynamic order is due to Howard C. Warren in his article "Mechanism versus Vitalism," *Phil. Rev.*, XXVII., 6, p. 614. His usage, however, is not exactly the same as ours. He speaks of static and dynamic *harmony*, and he limits the former to physics and chemistry. We consider static order to be universal.

adaptation is, or may be, disorderly. As a matter of fact variations with reference to specific conditions are eminently systematic. Otherwise how could a Cuvier or an Owen reconstruct the whole extinct animal from a single bone? Adaptation is orderly, though its teleological aspect introduces a new conception of order which justifies the distinctive adjunct, *dynamic*. Teleology is broad enough in its meaning to cover the whole field of adaptations, both in biology and in nature at large. We use it in the strict scientific sense to designate actual adaptations to specific conditions. Its use—or abuse—in natural theology is quite another affair.

Teleological relations have a very reliable degree of constancy; judgments and inferences based upon them approach about as near to ideal certainty as human reason can usually attain on any other grounds. Thus the logical value of teleology is twofold; it makes a direct contribution to the number of reliable logical constants, and it serves as a safeguard both of philosophical neutrality and against ultraformalism, a safeguard which is effective so far as nature's wholesome example can be effective. A logic characterized by mechanical rigidity stubbornly persisting in the face of prolific and flexible modifications of order-types, must at any rate forfeit all claim to be a natural system.

Logical constants are, however, for the most part based upon static order. Nearly all, if not all, of our examples already cited would come under that category. The old theologians might indeed see a purpose in the relation, steam—boiling water, but it would be a fanciful purpose like Derham's alleged function of volcanoes as warnings of hell-fire. Static order is first in logical priority and first in importance. It is the solid cornerstone of the logical superstructure.

L. E. Hicks.

Augusta, Ga.

A NEW CONTENT COURSE IN PHILOSOPHY[1]

I HAVE had some difficulty in devising a title for this paper. I thought at first of calling it "Neo-Positivism," and then it seemed that "Neo-Synthetic Philosophy" would meet the situation better, but further reflection indicated that each was too ambitious. I decided, therefore, to adopt the modest title that has been announced, although some perhaps may object that it is not strictly a content course, while others may deny that it is new, and still others that it is philosophy at all. Both objections and denials are prolific

[1] Read at the meeting of the Western Philosophical Association at the University of Wisconsin, Madison, Wis., April 17, 1920.

within our peculiar field. None the less, since some kind of title was necessary, I selected the one that erred, if at all, on the side of simplicity, rather than on the side of pretentiousness, although I am fully convinced, and I hope you will be too, that the general direction of my thought is both positivistic and synthetic.

For a number of years I have been convinced that an attempt to give a kind of cross-sectional view of the world upon the basis of what the various sciences are furnishing to-day would meet a real need in our college work. Most students who graduate from our colleges know something about a limited number of the sciences. Usually physics, chemistry, and biology, together with psychology and some one or two of the social sciences, constitute their entire scientific programme, and, indeed, they are fortunate if they get all these. But the field of the sciences has grown enormously within the last few years, both in the subjects treated and in the accumulation of material within their respective fields. It is true that some familiarity with the more important results is obtained through introductions to philosophy and kindred subjects, but not a little material in connection with such courses is rather necessarily more or less ancient, so that the students may be fully a lap or two behind current scientific views in the several fields. Of course, rigorous work in metaphysics would put students into touch with the most essential views of present-day scientists, but the number of students in the ordinary college who explore the mysteries of pure metaphysics is deplorably small. Consequently it has seemed to me advisable to introduce students to some fifteen or twenty different sciences so as to develop for them, as I have already indicated, a cross-sectional view of the world as the scientists themselves are presenting it.

I suspect that my thought was led in this direction by a series of lectures given at Columbia University in 1908 by some fifteen or more professors, each presenting his own field and trying to indicate within the limits of an hour or so what were the most assured results, the outstanding principles best attested in that field up to date.[2] It was an attempt to give within brief compass a comprehensive survey of the truths best substantiated in each of those fields at that time. Then, too, at about the same time, I learned of a new course that was being tried out on the freshmen in the same institution. This was designed as an orienting course. Several professors, representing different departments, gave each a series of eight lectures on his own particular subject, so that the freshmen might get a slight acquaintance with a large number of fields in order to decide rather early in their academic career what subject they would particularly care to specialize in. My own plan, I am very sure, was

[2] Columbia University, *Lectures on Science, Philosophy, and Art*, 1907–1908.

contained as a germ in these attempts, but the way in which I have developed it is not strictly dependent upon either or both.

When I first began to develop this new course in mind and to reflect upon its requirements, the field seemed too vast, too complicated for any one man to present even in outline. Several years later, however, I began to get acquainted with the little books published by Henry Holt & Co. in the series known as "The Home University Library of Modern Knowledge," and at once I became convinced that here was just the material needed. No opportunity, however, came to put my plan into operation until the present year, when with the accession of an assistant professor to our Hamline Faculty to take the introductory psychology off my hands I felt free to attempt some new work. The course which I have designated "The World of To-Day" is an actual putting into concrete form of the plan meditated for several years.

The course extends throughout the year, but the usual distinction between the inorganic and the organic worlds makes it possible to divide the subject-matter rather nicely according to semesters. At the outset last fall, I spent about three weeks on the little book in this series entitled *An Introduction to Science,* and then passed to a work on *Astronomy.* Ordinarily I have spent about two weeks on a book, but sometimes the material would demand a little more time and occasionally a little less. Since not all in the class had had specific training along the line of the general nature of science, it seemed wise to dwell a little longer upon the first topic. From the work on *Astronomy,* we passed to one on *The Making of the Earth* and then to one on *The New Geography,* another on *Polar Explorations,* and still another on *The Ocean.* Only a few selected topics were stressed from these last three books, such as the action of glaciers, the formation of icebergs in the Antarctic regions, and the general character of the waters of the ocean, its depth and currents, and a little contained in these three books on climate and weather. We then passed to a book on *Chemistry,* selecting the more salient topics, and then to *Matter and Energy,* more particularly the latter topic. This afforded a good opportunity to hark back to some of the material considered in connection with the work on astronomy, such as that which dealt with the "white nebulæ," and to connect that with the latest work on radio-active substances. At the beginning of the second semester, I dwelt somewhat longer upon a book entitled *The Origin and Nature of Life,* particularly that part which deals with the colloidal substances, and then took up *Plant Life* and *The Evolution of Plants.* From this point, we turned to a book on *Animal Life* and next to one on *Man,* with special emphasis upon the

development of the latter from the former. Next came a book on *The Principles of Physiology;* then one on *Psychology,* with brief reference to the growth of psychic phenomena parallel with the development of animals from the simple to the more complex; next a glance at a volume on *Psychical Research,* and lastly a hasty sketch of the organization of society. There is no book in the series with the specific title of *Sociology,* but there is some material of this nature in the volume on *Anthropology.* I do not speak quite so positively, perhaps you will note, with reference to these last few topics, because I have not yet given this part of the work, but that is the general programme that I am planning to follow. In connection with these several books, I may add, required readings from parallel works in the library are due each week and there is a written test on the average every two or three weeks. There are also free discussions at practically every class exercise and a final written examination covering the entire work of each semester. Such is the general plan of the course.

And now I want to give briefly several of the thoughts developed in the minds of the class by this method. In the first place, when we follow the lead of the astronomer, we become somewhat acquainted with the tremendous stretches of space which are all aglow and which have been denominated "white nebulæ." There is not entire unanimity in the interpretation of these nebulæ, but Moore, in the volume on *The Origin and Nature of Life,* suggests that there may be a double process taking place. "The chemist knows," he says, "that at the balancing point a reaction may run in either direction, varying with a slight disturbance towards synthesis or disruption." So, he suggests, "at this enormous temperature, either there is visible before our eyes dissociation of matter into its very first and simplest forms, or, it may be that the available high energy concentration at such a temperature is actually synthesizing and producing from the ether those first steps in the formation of matter." Moore himself inclines to the latter view and maintains that various unstable combinations of electrons are formed there, but that out of the variety of such combinations ultimately here and there actual atoms become fixed, and these have never yet, he maintains, been broken up under laboratory conditions. The atoms of Uranium, he suggests, have never yet reached stability, but are disintegrating, unravelling so to speak, and by their behavior they have let us into a secret of the universe that perhaps we could not have otherwise learned, or at any rate could not have learned so soon as we have.[3]

In this connection, too, I deal with both the older "nebular hy-

[3] Pp. 57–58, 68–104.

pothesis" and the more recent "planetesimal theory," and then, having landed upon the solid earth, I discuss the theories of the process by which the earth has come to have such a crust as we now know, the nature of the interior of the earth, some of the characteristics of earthquakes, and the formation of primary and secondary rocks. I take up next the problem of life, both from the angle of the strict scientific biologists who insist upon the formula *omne vivum e vivo* and of those more speculative biologists who assert that the general evolutionary theory demands the origin of life from the non-living here upon our own planet. At this point I find Moore especially helpful. He calls attention to the chemical principle of valency and insists that there is something similar in the behavior of molecules, particularly those huge aggregations, comparatively speaking, in more or less unstable equilibrium, which are at the basis of those colloidal substances from which living things were born. If we follow him in this view, we are prepared to appreciate the naturalness and simplicity of all early forms of life, and also the closeness of relation between the two generally accepted fields of living things and their cooperation. In this connection, too, I call attention to the many variations in the relations of the animal units to one another, and more especially to the varied relations within the limits of humanity. I dwell somewhat upon the instability of such relations in primitive life and enlarge upon the combinations that have been made of groups into nations only to be resolved back again into the original units, but to be combined again and again, until in these recent years the conception of a World-State has tentatively disclosed itself to our view. All this is easily regarded as parallel with the original tentative character of the early combinations of electrons in the vast nebulæ into *quasi* and then ultimately into actual atoms. Temporary instability of combinations seems to have been the rule, but this has been succeeded by stability all along the line, suggesting, perhaps, the ultimate World-State, but that time is not yet.[4]

An immediate application of such a survey as this to the field of thought is very easy. I indicate to the class that just as there have been combinations of electrons into atoms and of molecules into such substances as colloids, all being originally rather temporary but settling down finally into stable relations, so there have been many temporary interpretations of the world. Individual experiences of the world have been combined rather tentatively, but out of the plurality of such interpretations there have come at different stages of social development huge thought-schemes, or philosophies, which have

[4] Moore, *The Origin and Nature of Life*, pp. 123–158, 188–189.

served their day and generation, and indeed many succeeding generations, in a fairly satisfactory manner. Sooner or later, however, these aggregations of thought have tended to be set aside in favor of new combinations that meet the new, changed conditions better. Every such earlier formulation of thought on a large scale could be regarded as similar to the temporary combinations of electrons into *quasi* atoms, or as similar to the various kinds of colloids that were presumably tentatively formed before chlorophyll was ultimately developed as the basis of plant life. In this connection, too, it has been easy to point out that whatever individuals or peoples are apparently entirely satisfied with a particular thought-combination there we have the so-called conservatives, while those who at least try to make provision for the new material by incorporating it with the old or by modifying the old until it does include the new or, indeed, by making a new world-view out of the new material, whether it includes the old or not, are the more open-minded, progressive people of a community.

Another matter that I consider of no little importance comes out in connection with the little book on *The Evolution of Plants.* In that the principle is clearly enunciated that the more complex a form becomes the less is it likely to vary to meet changed conditions.[5] In other words, the simpler forms are the more plastic and better able to meet the changed conditions in their particular environment. The whole course of plant evolution shows a kind of zig-zag progression. Certain forms became decidedly complex and well adjusted to the conditions prevailing in a particular period or era, but when some of those great changes came, of which the geologists tell us, the more complex forms tended to disappear, while the simpler were able to become modified along somewhat different lines, and consequently they not only perpetuated themselves but overspread the earth in succession to the earlier complex forms which could not accommodate themselves to the changes. An application to the field of education grows directly out of this. The more highly specialized a man is in his education, the less readily can he meet changed conditions. Of course, ordinarily, the conditions of life are likely to remain fairly constant during the lifetime of any individual, but such a cataclysm as the Great War might seriously interfere with a highly specialized programme.

Parasites, also, proved to be an interesting subject, and one of not a little direct application to present-day social discussions. The term itself is not a popular one, except as a mark of opprobrium in some of the current radical socialist literature. None the less, the

[5] Scott, *The Evolution of Plants*, pp. 154–155, 229–239.

entire animal world can be regarded as a parasite, dependent as it is upon the vegetable world. Not a few technical parasites, too, seem to serve a useful purpose. For example, the *bacillus radicola* obtains its nourishment from the plant whose roots it inhabits, but at the same time it makes use of the free nitrogen of the atmosphere and thus furnishes rich nitrogenous matter to the plant itself for the production of protoplasm. "This is one of the very few organisms," Farmer says in his book on *Plant Life*, "which can perform this really stupendous task."[6] I am not developing a brief for the entire genus, nor for all within the limits of the human family often designated as such, but I am suggesting that some of the latter, while apparently only parasites, may actually make valuable contributions to our exceedingly complex social life.

As a final illustration of the possibilities in a course of this sort, I will submit the following: When we view the developing animal world from the amœba up to man, we may fasten our attention upon the nervous system, rather than upon the gross physical structure. Beginning in a very simple form in the hydra, it becomes more and more complex until the human brain is reached. This would seem to be the most valuable product of what we call the natural processes. Perhaps Nature herself, with the soft pedal upon the apparent personification, has reached her limit in this, her offspring. Think for a moment of the transformations which the universe has undergone from the nebulæ to the brain of man! But while Nature herself, following her usual course, may have reached her limit in the physical constitution of the human brain, the permutations and combinations of the neurones which make up that brain are practically infinite, suggesting almost infinite further modifications of Nature herself. In other words, we may say that the brain of man, brought forth from the womb of Nature, is an instrument by which Nature, having reached her limit by earlier methods, may continue to transform herself beyond almost any limits which we may at present assign. I know of no more inspiring thought than this at present to set before the minds of bright college men and women. If they learn to use their minds properly, they can cooperate with Nature in manifold transformations of the world in which we live; transformations, indeed, beyond anything, perhaps, of which we yet have dreamed.

Such, then, very sketchily, is the course. An objection that might readily arise, in addition to the one already partly met as to the source of the material, is that no man can make himself sufficiently familiar with all this vast field to guide students through it judi-

[6] P. 196.

ciously. My reply would be that those of us who teach the history of philosophy have a still vaster field to deal with. If we can make ourselves fairly familiar with the main outlines of Aristotle's metaphysics and of his various individual sciences; if we can follow through the intricacies of Plato's thought, deal adequately with the Stoics, Plotinus, and the Schoolmen; and if we can then wrestle at all successfully with Spinoza, Leibniz, Kant, Fichte, Schelling, and Hegel, to say nothing of more recent writers, we certainly ought to be able to follow any or all of the modern scientists, especially when their views are condensed severally, as in the Holt series, within the limits of 250 small duodecimo pages.

I might add, in closing, that I am planning a companion course for this one to be given next year. This aims to give a philosophic survey of what the human spirit has produced. It will deal with primitive life, both savage and barbarous, and with early and later civilizations. Modes of life, inventions, beliefs, forms of government and economic activities, art, literature, philosophy, and various contributions to modern life are some of the topics that will be treated as elaborately as time will permit. Much of our work in college is very fragmentary. Detailed studies of very limited fields are made and the student is expected to put together these *disjecta membra* into an illuminated and inspiring view of the world as a whole. The theory, within certain limits, is good, but there are not a few graduates who never "see the woods for the trees." The philosopher's function is largely to use the telescope, but not on a vacuum. In so far as he can make use, descriptively and appreciatively, of the results of the many sciences, both physical and social, and synthesize these into broad, helpful interpretations of the world as it is at the present day, will he more and more justify his position on a college faculty.

GREGORY D. WALCOTT.

HAMLINE UNIVERSITY.

REVIEWS AND ABSTRACTS OF LITERATURE

Problems of Science and Philosophy: Volume II. of the Papers of the Aristotelian Society for 1919. Pp. 220.

To the man on the street the word science connotes a laboratory crowded with glass and with brass, monstrous implements for exact measurement, flasks and retorts and balances, graphs and outlines and all the other paraphernalia of the trade. And one suspects that the man in the seminar has not a very different conception of this term which is said to give its individuality to our century. Science and experimentalism; they are taken to mean very much the

same thing. Those who define the word in this way are wont to overlook the all-important contributions of the "theorists," the determining influence which some sudden *aperçu* has had in guiding the direction of research, and the mighty "abstractions" which have been the milestones of scientific progress. Problems which are not amenable to treatment in the laboratory they will scorn as unscientific if, indeed, they do not deny their reality altogether. Therefore they would be inclined to dismiss such a volume as this collection of papers read before joint sessions of the Aristotelian Society, the British Psychological Society and the Mind Association, with scant attention. Scientific *problems* they may concede certain of these questions to be (though few might admit the third symposium—Can Individual Minds be included in the Mind of God?—into this category) but that scientific *methods* had been employed or scientific *solutions* achieved they would assuredly deny. They might suggest a revised title for the volume—*Problems of Science Maltreated by Philosophy.*

But to those who are less given to dogmatism and who make clear thought and precise investigation the essential prerequisites of science, these discussions will seem worthy of this high title. That is to say, they fully justify the expectations which the previous publications of the Aristotelian Society have aroused.

The first paper in the volume, otherwise given to three symposia, is a contribution by Mr. Bertrand Russell on "Propositions: What They Are and How They Mean." One is aware in reading this paper of how far Mr. Russell has gone in the direction of a psychologized philosophy. Even those who might quarrel with this tendency will concede the acuteness of his critique of one aspect of Behaviorism. And as an Apologia for his drift towards "subjectivism" we are told that "the use of words actually pronounced or written is part of the physical world, but in so far as words obtain their meaning through images, it is impossible to deal adequately with words without introducing psychology and taking account of data obtained by introspection." One is tempted to wonder whether "words" are the only symbols which necessitate the introduction of psychology or whether the next volume of the *Principia* will be based on "data obtained by introspection."

With this irreverent, and, it may be, irrelevant, comment on Mr. Russell's essay we may pass on to mention the symposia which constitute the bulk of the proceedings. But we shall not so easily be avoiding Mr. Russell himself, for in the last symposium we meet him again, albeit this time in his more ancient and austere function of logician. He himself took no part in the discussion of the ques-

tion "Is There Knowledge by Acquaintance?" but his name figures constantly in the argument, whether in Dr. Moore's defense of Russellian doctrine or in the attack in which Dr. G. Dawes Hicks, Miss Beatrice Edgell and Mr. C. D. Broad are allied (or associated). Verily, it's Russell, Russell all the way.

The second symposium, to which the majority of the speakers gave their attention, concerned "Time, Space and Material: Are They, and if so in what Sense, the Ultimate Data of Science?" One can easily see why six speakers should be required to present the various viewpoints implicit in this ancient dispute. But the terms of the argument in this instance are by no means ancient. The disputants may in general be divided into two groups; the defendants of the "older physics" of the other are ranged against the partisans of the new quantum physicists, with Einstein and Relativity as a sort of bugaboo in the background of the discussion. Thus Professor Whitehead presents an account in which "the material ether has disappeared. It is replaced by an ether of events, which is formed of events whose character is expressed by the properties of the electro-magnetic field" and which may surely be said to be no ether at all. Sir Oliver Lodge, on the other hand, insists that "unless the ether is taken into account the scheme of physics is unintelligible," but traces our original apprehension of the data of science to our experience of motion and force in the sense of effort. This observation is concurred in by Mr. J. W. Nicholson when he says that "the actual quantum itself is one of *action,*" but in general he is in agreement with Dr. Whitehead. The remaining three contributions to this symposium approach their problems from decidedly different standpoints. Dr. H. Wildon Carr pursues the historical mode of attack, Mr. Henry Head views the question from the standpoint of the physiologist, assuming that "the fabric of philosophy depends on the nature of physiological reactions produced by the impact of physical stimuli on sense organs," while Mrs. Adrian Stephen (Karin Costelloe) treats the problem as a Bergsonian.

An equally various approach to the problem characterizes the contributors to the remaining symposium: "Can individual Minds be included in the Mind of God?" In this discussion the protagonists are really Messrs. Pringle-Pattison and Bradley, neither of whom appears to have been present, for whereas not all of the disputants appear as partisans of one or the other, all find occasion to describe their solutions by explicit reference to these writers. Dean Hastings Rashdall champions the primacy of personality and concludes that "the Absolute—if you must indulge in that 'blessed word'—includes other minds; God, if He is a Mind, does not."

Bishop D'Arcy finds himself in such "complete agreement with Dean Rashdall" that he takes the opposite position, that of Mr. Bradley, though he presents a more "democratic conception of the Absolute." Professor Muirhead advocates a theory of organic relationships and holds that "self-transcendence so far from meaning a sacrifice of individuality is the only way to realize it." Dr. Schiller sees empirical evidence for the possibility of one mind including others in experiments in psychical research, but finds this conclusion objectionable not on intellectual but on moral grounds. And with characteristic and wholesome didacticism he insists that "if a tithe of the ingenuity which has been bestowed upon the deifying of the Whole had been devoted to exploring the possibilities of a divine intelligence more in accord with human nature, philosophic inquiry might have attained results far more considerable and satisfactory."

JAMES GUTMANN.

COLUMBIA UNIVERSITY.

An Outline of Abnormal Psychology: JAMES W. BRIDGES. Columbus, Ohio: R. G. Adams & Company, 1919, Pp. 126.

The omission of illustrations and typical cases makes the *Outline* rather dry reading. In fact, no one but a reviewer would ever attempt a consecutive perusal of its pages. Its undoubted usefulness to the beginner, or for directing the increasing number of general students of psychological topics, makes us wish for a brief evaluation of the semi-popular and popular literature that too often constitute the entire sources of information for the majority of readers. The outline and definition form of the text does not lend itself readily to the genetic viewpoint so generally stressed today in the literature. Dr. Bridges's acceptance of the "neurological explanation" as the final one (p. 12), in the present state of such "explanations," naturally conforms best to the disjointed nature of outlines. Though the social worker *et al.* may gain facility in the use of terms, understanding the case and skill in handling it can not arise from "surveys" of this type.

The book is a more comprehensive attempt to introduce orderly arrangement among the data of abnormal psychology than has hitherto been attempted. Such recent efforts at classification as those made by the late Dr. E. E. Southard and Dr. Adolph Meyer indicate that abnormal psychology and psychiatry are feeling the need of better or more thoroughgoing classification of the topics in their fields. We commend the book to those who are giving courses in this field. Other outlines should be published.

A new edition should eliminate a few proofreader's errors.

"Korssakow's psychosis" (p. 94), "Korsakoff's disease" (p. 95), "Korosokoff" (p. 97), and again "Korssakow's psychosis" (p. 102), need a footnote on variations in spelling, at least for the uninitiated.

C. S. YOAKUM.

CARNEGIE INSTITUTE OF TECHNOLOGY.

JOURNALS AND NEW BOOKS

THE AMERICAN JOURNAL OF PSYCHOLOGY. January 1920. *The Logic of the Normal Law of Error in Mental Measurement* (pp. 1–33): EDWIN G. BORING. – Scientific methods do not sanction the *a priori* determination of the form of curve of distribution. In mental measurements, a psychological unit has not been established, and because intelligence is such a vague term, quantitative terms in mental testing do not have much meaning. The attempt to measure mental activity in terms of physical units always raises the question as to whether the mental activity corresponds to the physical record adopted. There then seems to be little that can be done in psychological measurement in the strict sense because the knowledge of the unknown does not lead us into the known. *Foveal Adaptation of Color* (pp. 34–58): HUBERT SHEPPARD. – The fovea has a longer adaptation time than the perepheral portions of the retina. *The Foster-Child Fantasy* (pp. 59–76): EDMUND S. CONKLIN. – The foster-child fantasy was experienced by twenty-eight per cent. of the 904 cases studied. Suggestion and supposed mistreatment were the most frequent causes of this rather common fantasy. *A Method of Standardizing the Color Value of the Daylight Illumination of an Optics Room* (pp. 77–86): C. E. FERREE, G. RAND and I. A. HAUPT. The colorimetric sensitivity of photometer heads was found to run in the following order: Lummer-Brodhun, contrast type; Lummer-Brodhun, disappearance type; The Bunsen. *Minor Studies from the Psychological Laboratory of Cornell University. Size vs. Intensity as a Determinant of Attention* (pp. 87–90): ALMA M. BOWMAN. – Size bears a ratio to intensity of 3:1 to 4:3. *The Tonoscope as a Means for Registering Combination Tones* (pp. 91–93): EVELYN GOUGH and GENEVIEVE ROBINSON. – The Seashore tonoscope furnishes a meritous means of demonstrating difference tones. *Book Reviews* (pp. 94–96): G. H. Parker, *The elementary nervous system:* L. A. FIELD. Honorario F. Delgado, *El Psicoanalisio:* PHYLLIS BLANCHARD. *Book Notes* (pp. 97–100): Carl Emil Seashore, *The psychology of musical talent.* Howard C. Warren, *Human psychology.* W. B. Pillsbury, *The psychology of nationality*

and internationalism. James Winfred Bridges, *An outline of abnormal psychology.* Julius Pikler, *Sinnesphysiologische Untersuchungen.* A. E. Shipley, *The voyage of a Vice-Chancellor.* Joseph A. Leighton, *The field of philosophy.* W. E. Chancellor, *The health of the teacher.* Herbert Woodrow, *Brightness and dullness in children.* Raoul Mourgue, *Etude-Critique sur l'Evolution des Idées Relatives à la Nature des Hallucinations Vraies.* Rufus Steele, *Aces for industry.* Henry G. Hartman, *Æsthetics: A critical theory of art.* Christian D. Larson, *Business inspirations. Proceedings of the American Medico-Psychological Society.* J. W. Fewkes, *Prehistoric villages, castles, and towers of Southwestern Colorado.* William H. Holmes, *Handbook of aboriginal American antiquities.*

Radhakrishnan, S. The Reign of Religion in Contemporary Philosophy. London: Macmillan & Co. 1920. Pp. x + 467. 12/–.

Schofield, A. T. Modern Spiritism: Its Science and Religion. Philadelphia: P. Blakiston's Son & Co. 1920. Pp. x + 260. $1.50.

NOTES AND NEWS

Friends of philosophy and the humanities will welcome Vol. 4 of the *Annales de l'Institut Superieur de Philosophie* of the University of Louvain. It begins with the following short preface:

"The tragic fate of this city of learning and of science has startled the world. Everywhere there has been a great wave of sympathy, upon the support of which we must count for the aid indispensable to our rebuilding. The University of Louvain, however, is already coming back to life. It is at work with the few tools which escaped destruction and in the few buildings that were spared by the fire. The present volume is evidence of this labor. Among the studies here brought together one only, No. 5, was ready for the press in July 1914. Some of the others are the result of the leisure made unavoidable by the occupation. But most of them are the fruit of our new activity. The studies in experimental psychology, which were one of the interesting features of the preceding volumes, will not be found in this one. The psychological laboratory was plundered by the German troops the day before the armistice, and many papers were stolen or burned. It has taken a long time to recover from this disaster. At present new studies are under way, the results of which can be presented to the public in a short time."